REMARKS

Claims 1-18 are pending. Claims 1 and 9 are independent.

Applicant acknowledges with thanks the examiner's indication that claims 3, 5, 6, 8, 13, 17 and 18 would be allowable if re-written in independent form.

The examiner stated in the September 14, 2006, Advisory Action:

> Applicant's arguments filed 9/5/2006 have been fully considered but they are not persuasive. In response to applicant's argument that the Applicant's inventions is "configured to ... ". a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. The proposed amendments do not change the scope of the rejected claims and do not contain the previously indicated allowable subject matter. Thus, the rejection is not withdrawn..

Applicant amended independent claim 1 to clarify the structure of the device, namely, that the channel defined by the conductive lines is configured to capture at least one particle having an associated diameter, and that the channel has a pitch is at least equal to or smaller than the diameter of the at least one particle. Support for this clarification is provided, for example, in FIG. 3, at page 5, lines 3-17 and at page 6, lines 18-29 of the originally filed application. Applicant similarly amended independent claim 9. Applicant notes that because the examiner indicated in the Advisory Action that the amendments presented in applicant's Amendment in Reply to Final Action of July 12, 2006, were not entered, the amendments presented herein are made with respect to the claims that were presented in applicant's Amendment in Reply to Action of March 31, 2006.

Additionally, applicant amended claim 4 to clarify that each of the plurality of devices includes a pair of conductive lines, and amended claims 5-6 to clarify that it is the conductive lines of each of the devices that includes a pitch.

The examiner maintained the rejections of claims 1, 2, 4, 7, 9-12 and 14-16 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,928,892 to Storbeck et al. in view of U.S. Patent No. 5,247,827 to Shah.

Specifically, with respect to independent claim 1 the examiner stated:

> Storbeck discloses a particle detector however, does not expressly disclose the particle detecting integrated circuit including a device having a pair of exposed conductive lines defining a channel (Shah, Fig. 2 shown above show that the electrode/lines define a channel) to receive particles with the pair of exposed conductive lines spaced at a pitch relating to the diameter of particles of interest.
>
> Shah discloses the particle detecting integrated circuit including a device having a pair of exposed conductive lines spaced at a critical pitch corresponding to particles of interest. (Shah. Figure 1 - also see above response to arguments)
>
> The two references are analogous art because they are from a similar problem solving area of particle detection inside a semiconductor processing chamber during manufacturing. (Final Action, pages 4-5)

Additionally, responding to applicant's arguments presented in the Amendment in Reply to Action of March 31, 2006, the examiner stated in the July 12, 2006 Final Action:

> In regards to the specific detector design Shah discloses the detector is made of two electrodes. Two electrodes are obviously two conductive lines (Shah, Fig. 2 shown below). The spaced lines/electrodes measure the conductivity of particle, which obviously relies on a particle to complete an electrical connection between the two electrodes/conductive lines, therefore it is obvious that they are spaced with a pitch related to the diameter of the particles of interest. If the line are spaced too far apart the particles will pass directly between the lines and not complete the electrical connection, and the detector will not work. As the independent claims are worded, they are not patentably enforceable over Storbeck et al. in view of Shah. (Final Action, pages 2-3)

Applicant's independent claim 1 recites "a vacuum chamber containing a particle detecting integrated circuit, the particle detecting integrated circuit including a device having a pair of exposed conductive lines defining a channel configured to capture at least one particle having an associated diameter, the channel having a pitch that is at least equal to or smaller than the diameter of the at least one particle to be captured." Thus, to capture the particle of interest, and thus detect its presence, the pitch of the channel has to be at least equal to or smaller than the diameter of the particle of interest, or otherwise a closed path will not be formed between the conductive lines. As explained in applicant's originally filed application:

> **Process 100 applies (104) a voltage to the pair of conductive lines and detects (106) a change in an electrical property of the conductive lines resulting from a particle landing on or between the pair of conductive lines. A metallic particle having a diameter the size of the pitch between the lines,**

> **or larger, generates a short in a current flow between the lines. A non-metallic particle having a diameter the size of the pitch between the lines, or larger, generates a change in capacitance between the lines. The short and/or change in capacitance is detected by the computer system. Once detected, corrective action can be initiated. (page 6, lines 18-29)**

In contrast, Shah describes an apparatus and method for measuring conductive airborne particulates that includes a filter having a pair of interdigitated electrodes (Abstract). Specifically, Shah explains:

> **A mesh filter element 16 intercepts the air flow 12 and has a mesh size sufficiently small so as to trap particles carried in the air flow 12 on its upstream surface. (col. 2, lines 17-20)**

And:

> **A porous membrane 30 is fused to a plastic collar 32. The filter described to this point is commercially available as part number R2PJ037 from Gelman Sciences, Inc. of Ann Arbor, Mich. under the trade name Teflo filter. The porous membrane 30 of this filter is composed of teflon with a pore size (diameter) of 2 μm. It has an overall diameter of 3.7 cm. (col. 2, lines 34-40)**

Thus, in Shah's device it is the pores of the mesh that capture the particles, not the interdigitated electrodes. The pores of the mesh, having a diameter of 2 μm, are small enough to trap particles passing through the mesh. When enough particles are trapped by the mesh and form a cluster of particles that effectively create an electrical path between one digit of one of the electrodes imprinted on the mesh and a digit of the other electrode imprinted on the mesh, the conductivity of the particles can be measured. Additionally, applicant contends that there is no suggestion anywhere in Shah to remove the mesh and thus capture particles in some other manner. Accordingly, Shah does not disclose or suggest at least the feature of "a pair of exposed conductive lines defining a channel configured to capture at least one particle having an associated diameter," as required by applicant's independent claim 1.

Moreover, Shah further describes that:

> **Silk screening using a conductive silver-based flexible ink, type A3706 from Engelhard Industries, Inc. of Newark, N.J., then prints an electrode pattern on a side of the mesh 30. The printed electrode pattern is sufficiently thick so as to have relatively negligible resistance compared to the dust being measured. The electrode pattern consists of a pair of interdigitated electrodes 18 and 20 each consisting of a pad 34 or 36 and five electrode**

> **fingers 38 or 40. A complementary pair of electrode fingers 38 and 40 are separated by a distance of 0.5 mm. (emphasis added, FIG. 2, col. 2, lines 40-50)**

Thus, the electrode fingers imprinted on the mesh of Shah's apparatus have a spacing of 0.5mm. As noted above, the pores of the mesh that capture the particles to be detected have a diameter of 2 μm. Those pores are therefore structured to capture particles that have a diameter of at least equal to, or less, than 2 μm. It follows that the spacing between the electrode fingers of Shah's apparatus are much larger than the diameter of the particles to be detected. Accordingly, Shah also does not disclose or suggest the feature of "the channel [defined by two conductive lines] having a pitch that is at least equal to or smaller than the diameter of the at least one particle to be captured," as required by applicant's independent claim 1.

As for Storbeck, as noted above, the examiner admitted that:

> Storbeck discloses a particle detector however, does not expressly disclose the particle detecting integrated circuit including a device having a pair of exposed conductive lines defining a channel (Shah, Fig. 2 shown above show that the electrode/lines define a channel) to receive particles with the pair of exposed conductive lines spaced at a pitch relating to the diameter of particles of interest. (Office Action, page 4)

Storbeck, therefore, also does not disclose or suggest at least the features of "a pair of exposed conductive lines defining a channel configured to capture at least one particle having an associated diameter" and/or "the channel having a pitch that is at least equal to or smaller than the diameter of the at least one particle to be captured," as required by applicant's independent claim 1.

Because neither Storbeck nor Shah discloses or suggests, alone or in combination, at least the features of "a vacuum chamber containing a particle detecting integrated circuit, the particle detecting integrated circuit including a device having a pair of exposed conductive lines defining a channel configured to capture at least one particle having an associated diameter, the channel having a pitch that is at least equal to or smaller than the diameter of the at least one particle to be captured," applicant's independent claim 1, and the claims that depend from it, are therefore patentable over the cited art.

Independent claim 9 recites "a particle detecting integrated circuit embedded in the mask stage, the particle detecting integrated circuit containing a device having a pair of conductive lines exposed to a local vacuum environment, the pair of lines defining a channel configured to capture at least one particle having an associated diameter, the channel having a pitch that is at least equal to or smaller than the diameter of the at least one particle to be captured." For at least similar reasons as those provided with respect to independent claim 1, at least this feature is not disclosed by the cited art. Independent claim 9 and the claims that depend from it are therefore patentable over the cited art.

It is believed that all the rejections and/or objections raised by the examiner have been addressed.

In view of the foregoing, applicant respectfully submits that the application is in condition for allowance and such action is respectfully requested at the examiner's earliest convenience.

All of the dependent claims are patentable for at least the reasons for which the claims on which they depend are patentable.

Canceled claims, if any, have been canceled without prejudice or disclaimer.

Any circumstance in which the applicant has (a) addressed certain comments of the examiner does not mean that the applicant concedes other comments of the examiner, (b) made arguments for the patentability of some claims does not mean that there are not other good reasons for patentability of those claims and other claims, or (c) amended or canceled a claim does not mean that the applicant concedes any of the examiner's positions with respect to that claim or other claims.

The fees in the amount of $120 and $790, for a Petition for One Month Extension of Time and a Request for Continued Examination, are being paid concurrently on the Electronic Filing System (EFS) by way of Deposit Account authorization. Please apply any other required fees to deposit account 06-1050, referencing the attorney docket number shown above.

Respectfully submitted,

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